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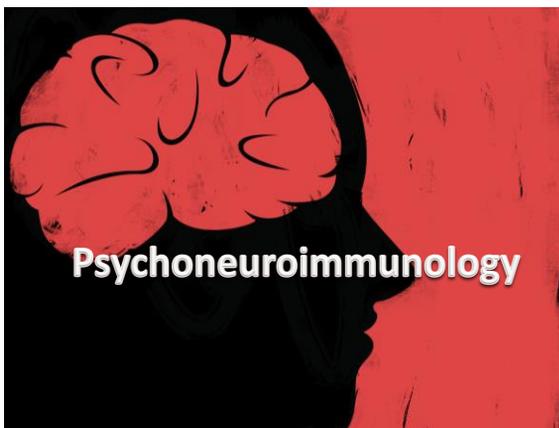
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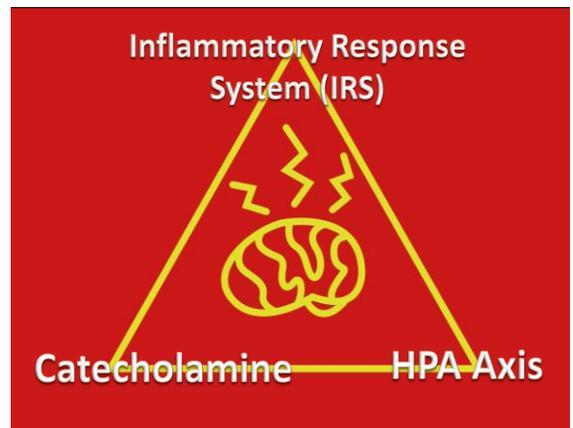
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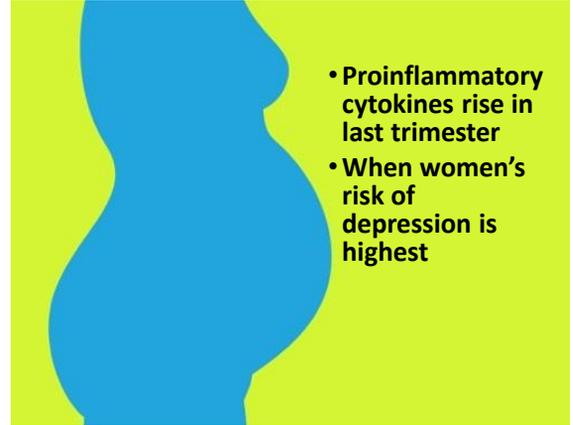
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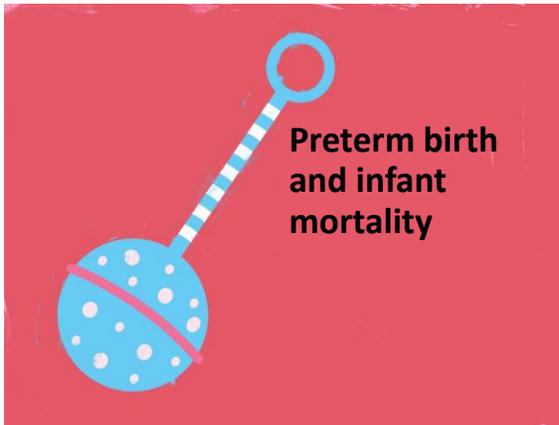
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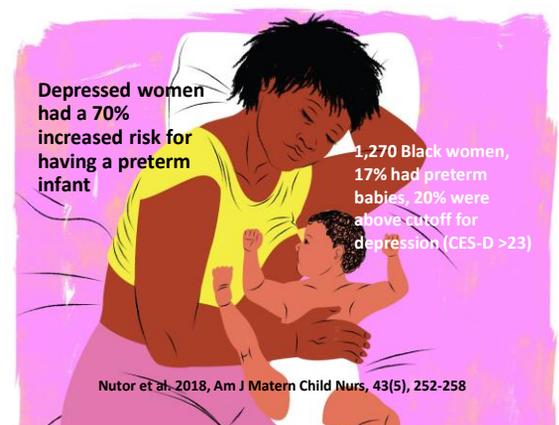
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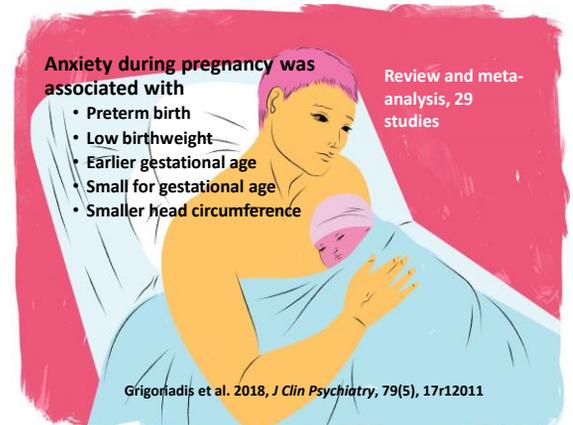
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Strong evidence that depression, anxiety, and stress during pregnancy increase the likelihood of preterm birth

Systematic review of 39 articles



Staneva et al. 2015, *Women, Birth*, 28(3), 179-193

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- “Human studies support the association between elevated levels of circulating proinflammatory cytokines and PTB.
- Specifically, human studies have implicated IL-1, TNF, and IL-6 as major players in PTB.”

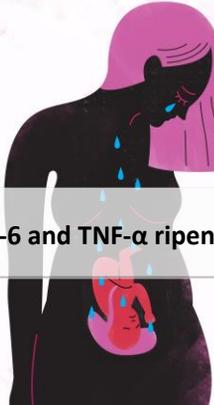
Cappelletti et al. 2016, *J Leukocyte Biol*, 99, 67-78

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IL-6 and TNF- α high in stressed and depressed mothers

IL-6 and TNF- α ripen the cervix

Coussons-Read et al. 2005, *Psychosom Med*, 67, 625-631

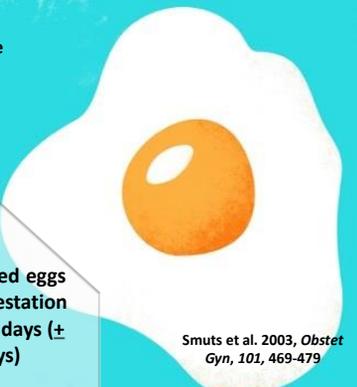


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291 low-income moms, Kansas City WIC

DHA-enriched eggs increased gestation length by 6 days (\pm 2.3 days)

Smuts et al. 2003, *Obstet Gyn*, 101, 469-479

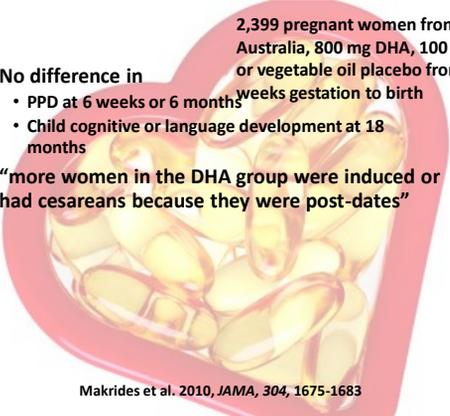


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2,399 pregnant women from Australia, 800 mg DHA, 100 EPA, or vegetable oil placebo from 21 weeks gestation to birth

- No difference in
 - PPD at 6 weeks or 6 months
 - Child cognitive or language development at 18 months
- “more women in the DHA group were induced or had cesareans because they were post-dates”

Makrides et al. 2010, *JAMA*, 304, 1675-1683



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- “Omega-3 supplementation during pregnancy is an effective strategy for reducing the incidence of preterm birth”
- “More studies ... are not needed at this stage”

Cochrane Review, 70 RCTs (N=19,927 women), on N-3 supplementation during pregnancy

Middleton et al. 2018, *Cochrane Database Syst Rev*, Nov 15;11(11):CD003402



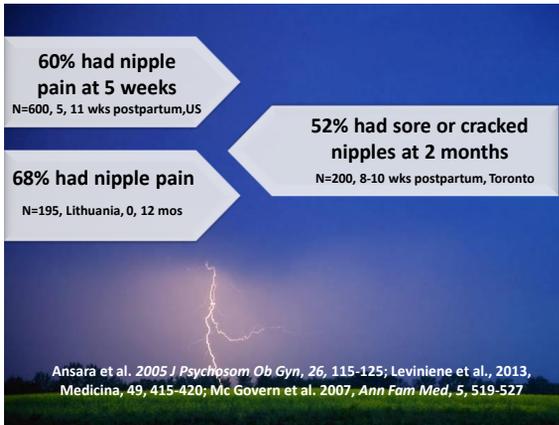
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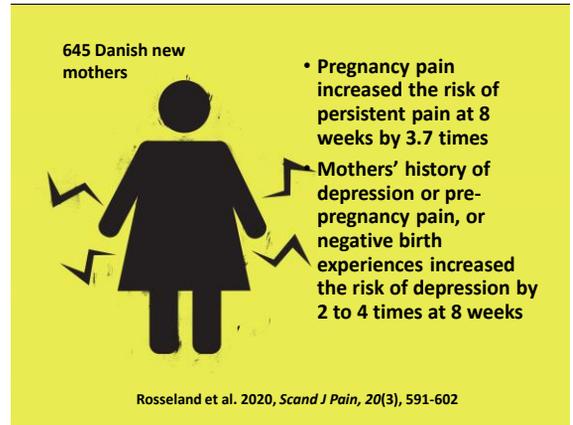
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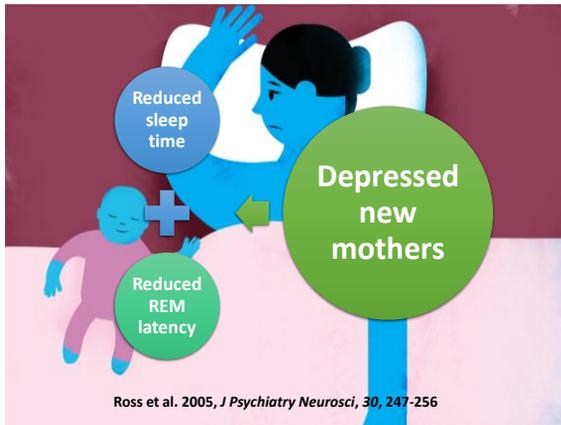
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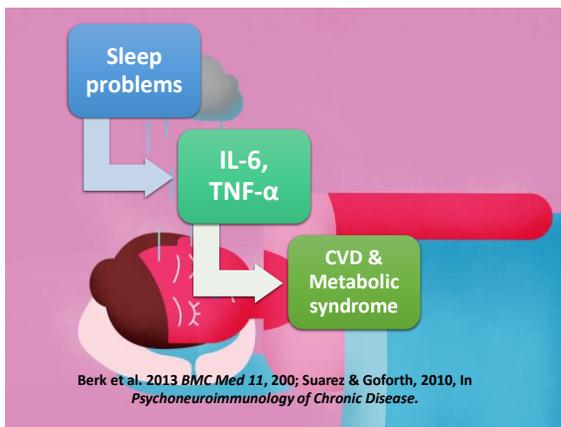
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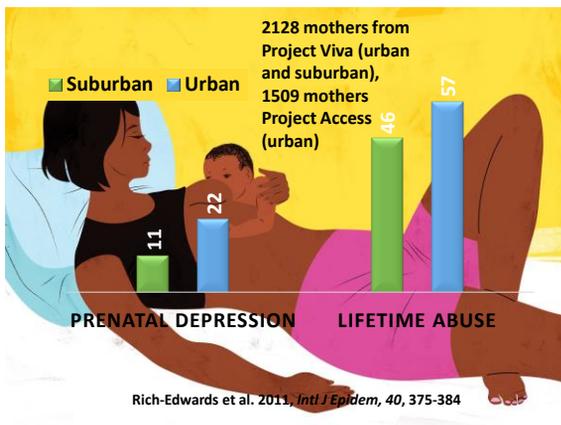
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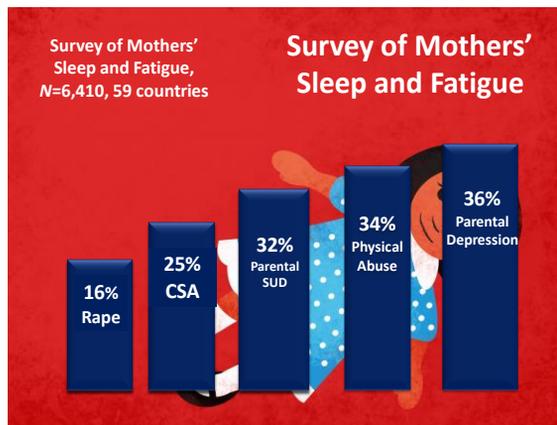
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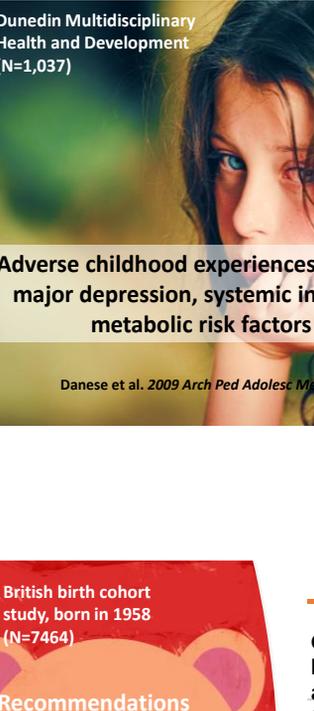


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Dunedin Multidisciplinary Health and Development (N=1,037)



Adverse childhood experiences increased rates of major depression, systemic inflammation, and metabolic risk factors at age 32

Danese et al. 2009 *Arch Ped Adolesc Med*, 163, 1135-1143

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Prenatal and Childhood Adversity

C-Reactive Protein

Collaborative Perinatal Project (1959-1972), 355 offspring (M age=42)

Slopen et al. 2015, *Psychoneuroendocrinology*, 51, 403-413

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British birth cohort study, born in 1958 (N=7464)

Recommendations

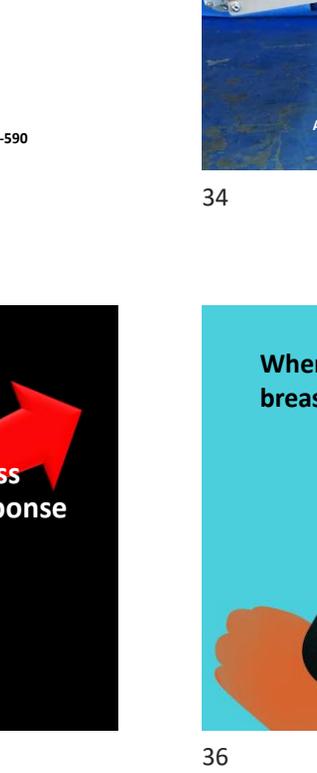
- Protect children from ACE
- Support children through education into skilled, secure work

Graded relationship between ACEs and adult inflammation (CRP and fibrinogen)

- Explained by SES and health behavior

Chen & Lacey 2018, *Brain Behav Immun*, 69, 582-590

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Up to 9% of mothers in the U.S. had birth-related PTSD

46% described their births as traumatic

Alcorn et al. 2010 *Psychological Med*, 40, 1849-1859;
Beck et al. 2011, *Birth*, 38(3), 216-227

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Stress Response

Trauma

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Where does breastfeeding fit in?

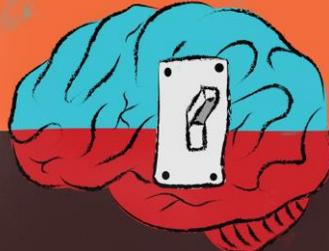
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- Lowers maternal stress
- Lowers inflammation
- Regulates mother/infant sleep
- Improves mother/infant self-efficacy
- Promotes mother/infant attachment

Figueiredo et al. 2013, *J Pediatr*, 89(4), 332-338

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OXYTOCIN

STRESS

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Are breastfeeding mothers healthier to begin with?

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- Prospective studies
- Physiological changes
- Regulation of sleep

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Women who were breastfeeding at 3 months had significantly lower depression at 24 months

Prospective study, N=205, assessed 5 times prenatally, 3,6,12, & 24 mos postpartum

Hahn-Holbrook et al. 2013, Arch Women's Ment Health, 16, 411-422

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- Less depression for BF 9 times/day vs 4 times/day
- Mothers depressed during pregnancy are less likely to breastfeed and weaned 2.3 months earlier

Hahn-Holbrook et al. 2013, Arch Women's Ment Health, 16, 411-422

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For women depressed during pregnancy, EBF lessened their symptoms and led to lower rates of depression between 3 and 6 months postpartum

Prospective study, 334 participants, 70 depressed, 264 not depression, assessed 3rd trimester, 3-6 months pp

Figueiredo et al. 2021, J Hum Lact, doi: 10.1177/0890334421991051

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Short-term lessening of the stress response

Response to induced stressor

ACTH

Cortisol

Baby at the Breast Lowers Mothers' Stress

Heinrichs et al. 2001, J Clin Endo Metabol, 86, 4798-4804

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Hypertension

Diabetes

CVD

High Triglycerides

Lifetime Protection For Mothers

139,681 post-menopausal women (Mean age=63)

Schwartz et al. 2009, Obstet Gyn, 113, 974-982

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Mother-infant sleep

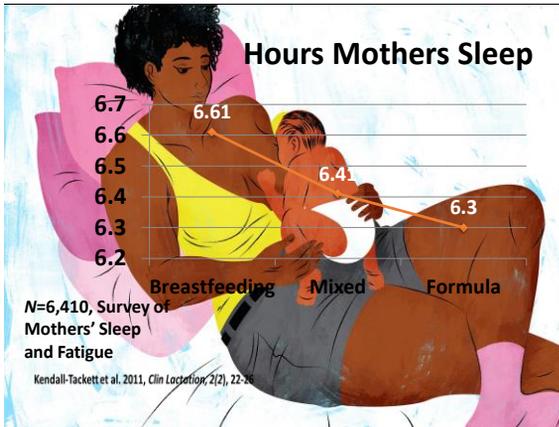
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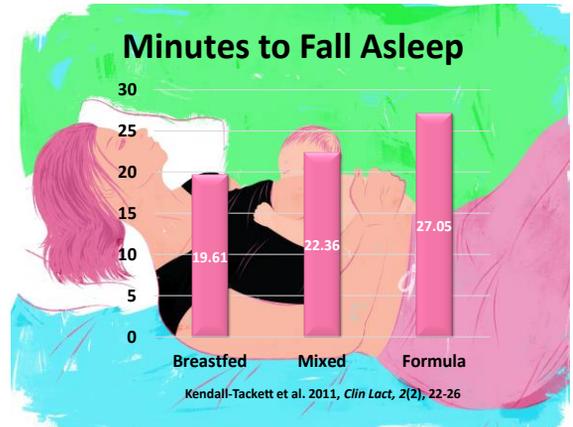
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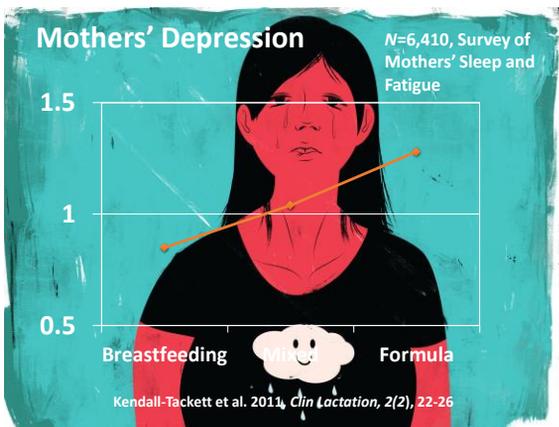
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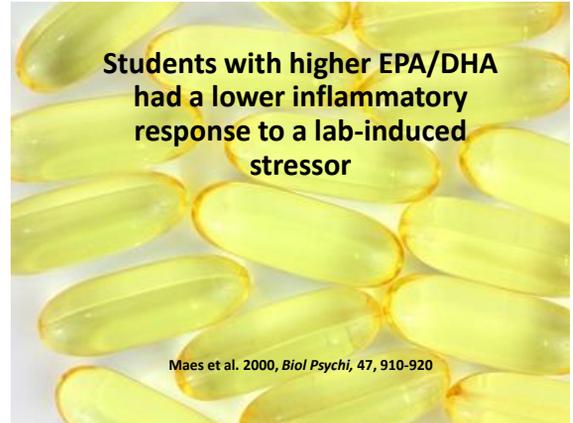
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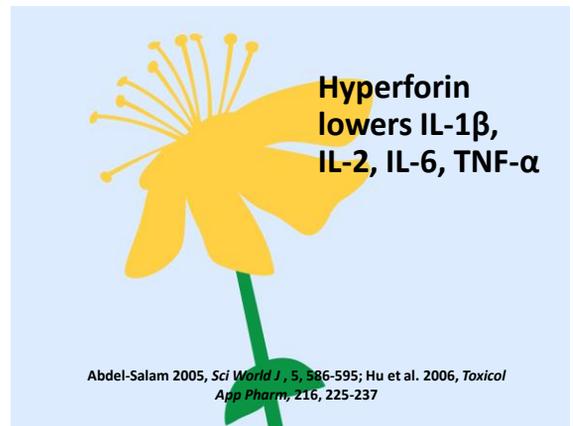
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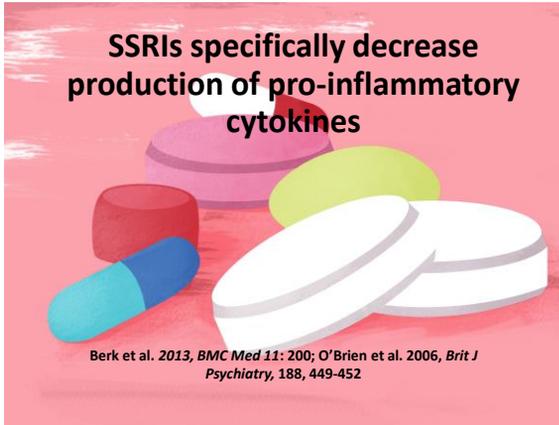
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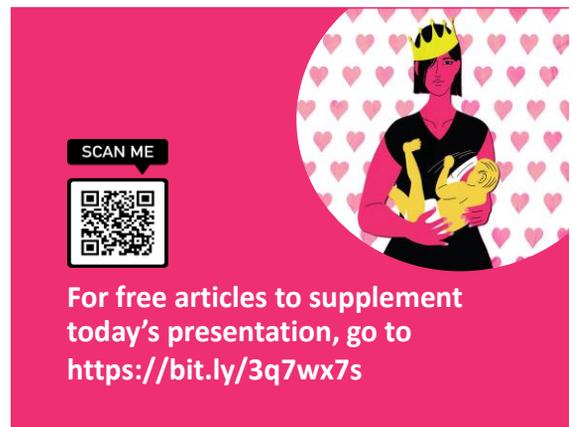
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